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In investigating patterns of family relationships conducive to creativity, several inventory-type personality tests and a questionnaire about family relationships and childhood interests were sent to 99 Mills College alumnae 5 years after their graduation and to the siblings of 51 of them. All had been tested, while seniors, for personality and some had been selected as creative by the faculty. The 12 of the 51 who had been picked as creative had nine sisters and eight brothers participating while the comparison 39 had 31 sisters and 28 brothers participating. The creatives had higher verbal aptitude scores and made better grades than the other seniors (p .01) and since graduation had shown a higher level of creative activity (p .001). The brothers and sisters of the creatives consistently made higher scores than siblings of other Mills women on the indices of creative traits: they had a higher educational level (p .01); and the brothers received more honors for intellectual distinction (p .01). For the creative Mills sisters, support was found for the conceptualized pattern of having the following: dissatisfaction with their relationships in the family, symbolic facility and an approach to the world focused on the potential or intuitive rather than the practical, and confidence that they could intervene in symbolic affairs and could by their efforts and initiative gain a more satisfying set of relationships. (SN)

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# EFFECTS OF SIBLING CHARACTERISTICS AND PARENTAL VALUES ON CREATIVE INTEREST AND ACHIEVEMENT

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# EFFECTS OF SIBLING CHARACTERISTICS AND PARENTAL VALUES ON CREATIVE INTEREST AND ACHIEVEMENT

This study utilizes as subjects a sample of young women, some of them previously considered creative by their college faculty, and the brothers and sisters of these young women. It is intended as an inquiry into the values and family relationships that are associated with the development of the creative personality. Because the nucleus of the sample is the set of creative college women, it is in particular an investigation of the family relationships which are associated with creative achievement in daughters or sisters. The amount of creative accomplishment by American women remains small, despite much opportunity and encouragement by educators, scholarship committees, etc. There are presumably strong social forces at work to maintain traditional sex roles. We hoped, therefore, that family influences associated with creative development in women would show themselves with particular clarity, and also that the study could contribute to an understanding of what is often considered the social waste of talent in women.

A creative accomplishment is taken in this study to be a symbolic product which is both original and at some level useful or valuable to those competent to judge it. We have been influenced by the Rankian idea that the creative person is one who has some basic estrangement or lack of adaptation to social norms but has achieved a constructive integration of his own point of view and that of society (Rank, 1945; MacKinnon, 1965). The problem of the present study is then to investigate the conditions in the family which would produce individuals who are "nonadapted" but can by creative accomplishment relate to society on their own terms.

Studies of sibling relationships frequently yield conflicting results, because they have failed to specify the important psychological variables (Sears, 1950). We have tried to take more variables into account than many of these studies, and to use psychological constructs which may be expected to generalize beyond the very particular sample which has been the object of this investigation.

The following conceptual structure has guided the selection of variables and design of materials: the motivation to engage in creative activity, for a child, reflects (1) dissatisfaction, or a nonadapted position, with regard to one's relationships in the family; (2) symbolic facility and an approach to the world which is focused on the potential or intuitive rather than the practical; (3) confidence that by one's efforts and initiative one can intervene in (symbolic) affairs and bring about a more satisfying set of relationships.

The effect of sib-sex position on intellectual achievement or creative activity may be analyzed in terms of its implications for the above components.

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For example, the first-born child is consistently overrepresented in samples of high achievers or creative persons. Several psychological factors which affect the oldest child appear to increase their predilection for eminence. One is that the oldest child often starts off with much love and affection from anxious and unskilled parents, and then, when another child arrives, experiences a drop-off in affection and attention which later children do not suffer (Lasko, 1954). Oldest girls in particular show evidence of stress (Macfarlane, Allen and Honzik, 1954). The older child cannot compete with a younger one in behavior which elicits attention or cuddling so well as he can compete, by virtue of his maturity, in intellectual or physical skill, which brings esteem. Thus oldest children, especially girls, often show some advantage over persons of other sibling positions on tests of verbal intelligence (Rosenberg and Sutton-Smith, 1966; Koch, 1954). This combination of drop-off in affection and attention (producing a non-adapted position in the family for the oldest child) along with confidence in symbolic skills would seem to predispose the oldest child to intellectual accomplishment. On the other hand, the oldest child is repeatedly found to be a conformist, a fact which is attributed to his unsatisfied dependency needs and to his social role as bearer of the family property and values. It is clearly of importance, then, to take into account what the family values are (Strodtbeck, 1958), or to what extent the oldest child can achieve "a more satisfying state of affairs" through achievement by conformity. It is important whether the oldest child has, by nature or through his identifications and other family experiences, the qualities of richness and breadth (complexity, intuitiveness) in his cognitive processes. If not, he will be unlikely to obtain sufficient emotional satisfaction by symbolic means.

Some of the same factors which affect the first-born child differently from the later-born also affect the male child differently from the female child: the boy more than the girl renounces dependency and affective relationships and is valued for his intellectual and physical skills. It is our particular interest to discover the family circumstances in which girls develop, or do not develop, creative traits. In a study of women mathematicians, all the subjects, but particularly the more creative ones, tended to come from families of girls (Helson, 1961). What may be more generally true is that there is some diminution of sex-role differentiation, so that the creative girl is not discouraged from effort and initiative as "problem-solving" techniques, or from the prospects of gaining esteem from independent intellectual accomplishment.

In previous work creative women have been reported to show distinctive patterns of childhood interests (Helson 1965, 1966). These childhood interest patterns may be regarded as "need-integrates" after Murray (1938), and considered to portray the creative personality at an early stage of development. Since the child's needs have very much to do with family values and relationships, we have tried in this study to relate childhood interest patterns to personality traits of siblings and parents.

## METHOD

### Sample

In 1958 and 1960 about two-thirds of the senior class at Mills College, a liberal arts college for women, attended testing sessions conducted by the Institute of Personality Assessment and Research (IPAR). Information from college records indicates that the samples were representative of the class as a whole. The faculty at Mills was asked to nominate women whom they considered to show creative potential for creative work in the arts, sciences or humanities. Subsequent ratings of originality for these and certain comparison Ss (see below) were obtained from the faculty and were used in conjunction with the nomination as a criterion of creativity. Evidence indicates that the criterion had considerable validity (Helson, 1967b). The creative Ss and comparison Ss with whom they were matched on scholastic aptitude and departmental major were invited to IPAR for interviews and additional study. The parents of the members of this "assessment sample" furnished information by mail which will be utilized in several parts of the present study.

Five years after graduation, test and questionnaire data were obtained by mail from the Mills alumnae. There were 135 participants in the earlier study (both senior classes combined) and 99 in the follow-up study. The college scores on measures of scholastic aptitude and various traits relevant to creativity for the 99 Ss did not differ significantly from those for the 135; they were slightly higher.

Names and addresses of siblings were solicited from the alumnae. Of the 99 alumnae, 25 were only children or had step-siblings only. Names and addresses were obtained from 69 Ss, and siblings of 51 of these women responded to an invitation to participate in the study. The letter of invitation is shown in Appendix I.

Test scores of Mills alumnae whose siblings participated in the study do not differ from those of the larger sample of alumnae. Among the siblings are 9 sisters and 8 brothers of "creative" Ss, representing 12 different families, and 31 sisters and 28 brothers of comparison Ss, representing 39 families.

The sample of siblings is strongly biased. The central bias is that all of the families represented have at least one daughter, and that daughter a graduate of Mills College. In the Mills senior class, only and oldest children were overrepresented. Of the 51 Ss whose siblings participated in the study, 31 are oldest children, whereas only 14 of the 76 siblings are oldest children. Whether or not she was an oldest child, the daughter who went to Mills tended to be a serious and individualistic girl. As a result of these factors, we presume, both brothers and sisters seem to be looking up slightly to their (big) sister, and comparisons of test scores give a consistent advantage to the Mills sisters that is larger than the average difference in age of 2 years can explain.

Information about family size and sibling composition is presented in Appendix II. In comparing the siblings of the creatives with siblings of comparison Mills Ss, there is the problem that the creatives were themselves

not representative in sibling position: they were the older of two, or the oldest of three or more with a brother next, or they were the second child with an older brother--in one case the brother was not older but a twin. The brothers of the creatives are somewhat older than the other brothers, and the sisters are significantly younger ($p. < .01$).

Some attempts to correct these biases have been made. However, the small size of the sample and the pervasive nature of the biases have reinforced our intent to describe the family patterns represented rather than to try to isolate the effects of individual variables.

## Tests and Measures

Tests. The siblings were sent several inventory-type personality tests and a questionnaire about family relationships and childhood interests.

The personality tests were chosen to give a comprehensive picture of the personality functioning of these young adults with particular attention to traits relevant to cognitive style, educational attainment and creative productivity. These instruments were the California Psychological Inventory (CPI) (Gough, 1964), the Type Indicator (Myers, 1962), the Adjective Check List (Gough, 1960; Gough and Heilbrun, 1965), the Art Scale (Barron and Welsh, 1952), and supplementary items to allow scores to be computed on the Complexity of Outlook, Independence of Judgment and Verbal Originality scales (Barron 1953a, 1953b, 1965), and the Originality (IPAR), Originality (DRS) and General Effectiveness scales (Gough, 1952, 1956). Scores were available for the Mills sister on all of these measures.

The CPI was developed to measure the interpersonal and positive aspects of personality. The 18 scales fall into three main categories: measures of poise, ascendancy and self-assurance; measures of socialization, maturity and responsibility; and measures of achievement potential, intellectual efficiency and intellectual interest.

The Type Indicator, a test based largely on Jung's theory of psychological types, contains four dimensions. The Intuition-Sensation dimension measures interest in ideas and possibilities as opposed to sensory facts and realities. The Perceptive-Judgmental dimension measures open-mindedness as opposed to a judgmental attitude. The other two dimensions are Thinking-Feeling and Extraversion-Introversion.

The ACL consists of 300 descriptive adjectives. The S checks those he feels most descriptive of himself. Scores are derived on 24 scales, some developed by Gough and others by Heilbrun. The Heilbrun scales measure manifest needs and other variables conceptualized by Murray (1938).

The Art Scale presents S with line drawings, some simple and symmetrical others asymmetrical and complex or even chaotic. A score is derived which expresses S's preferences for the complex and disorderly.

The three Barron scales consist of inventory items which distinguished high-scorers on cognitive traits which were considered to be characteristic

of creative persons. Originality (IPAR) was first developed from items which differentiated graduate students rated high by the University of California faculty on productive originality. Originality (DRS) is a rational scale which consists of subscales entitled Intellectual competence, Inquiringness, Cognitive flexibility, Esthetic sensitivity and Sense of destiny.

The General Effectiveness Scale was developed in a number of IPAR studies of achievement and personal effectiveness. It provides an index of "potential success"--of drive, ambition and sense of direction.

The questionnaire was used to obtain information about the sibling's educational attainment, occupation, comparisons of himself and his Mills sister in childhood, true-false statements pertaining to factors which might contribute to similarities or differences between them, and a rating of values which the mothers and fathers were felt to stress for the sibling.

The last page of the questionnaire was a childhood activities checklist which S filled out by indicating the degree of pleasure he had experienced from each of about 40 activities. There were separate checklists for brothers and sisters.

Scoring. Educational attainment was scored on a 5-point scale as follows: 1, finished high school; 2, attended college; 3, received undergraduate degree; 4, attended graduate school; 5, received (or working toward) doctoral degree.

Occupation was classified as scientific, other professional, business, technical, artistic, and other.

Questions pertaining to sibling comparisons and parental values are shown in Appendix II. This material was scored on a 3-point scale, 3 indicating strong affirmation or that the sibling was stronger in the respect mentioned, or that the parent stressed the value more than other values. A 2 indicates no difference between siblings, or intermediate importance of influences or values; and 1 indicates that the Mills sister was stronger in the respect mentioned, or it indicates least importance of influences or values.

For sisters, the imaginary-artistic (IA) index from the Childhood Activities Checklist was scored. Previous studies indicate that many creative women had interests of the IA type in childhood (Helson 1965, 1966). The IA index represents the proportion of all activities most enjoyed which are contained in the following list: creating complex imaginary situations and acting in them; writing poems and stories; putting on shows; painting, drawing and working with clay; playing the piano, violin or other musical instrument; reading; and playing alone.

For brothers and sisters, individual activities of the Childhood Activities Checklist were scored on a 4-point scale according to degree of enjoyment.

## Analyses

Three main types of analysis were conducted.[1] First, personality test scores for all siblings returning the completed forms and selected scores for the Mills sister were correlated with each other and with measures from the family relationships questionnaire. Second, t-tests were computed on all of these measures between groups which were constituted to investigate the influence of sex and creativity of sister. No more than one sibling per family was included in each group, in each case the sibling closest in age to the Mills sister. In these t-tests, and only here, 2 older brothers of creatives for whom data were incomplete and 2 teenage brothers of comparison Ss were eliminated so as to equate the two groups of brothers on age and sib position. It was not possible to equate the comparable groups of sisters. In other t-tests, conducted to find the influence of sibling position or sib-sex patterning, the Mills sisters were included in the groups, for example, among groups of oldest girls with a brother next or of oldest girls with a sister next. These groups which included the Mills Ss were compared only on the CPI and Gough-Heilbrun scales.

Third, to investigate patterning of family relationships in the background of the siblings, multiple prediction analyses were conducted to predict whether or not the sibling's sister was a Mills creative. Separate analyses were conducted for brothers and sisters. The 21 variables utilized were several ratings of values of mothers and fathers, and scores on several traits or relationships on which the siblings had compared themselves with the Mills sister. They were chosen to fit the guiding conceptualization of the family origins of creativity as follows:

(1) "Non-adapted" position in family: Comparisons with sister in rebelliousness, congeniality with mother and congeniality with father, and importance in the family, parents took (me,her) more seriously.

(2) Symbolic facility: Comparison with sister in intelligence.

(3) Intuitiveness vs. practicality: Comparison with sister in being practical.

(4) Confidence that by one's effort and initiative . . . : Comparisons with sister in self-confidence, initiative and persistence . . .

(5) . . . One can achieve a more satisfying state of affairs: Comparisons with sister on esteem from father, esteem from mother and strong interests, in conjunction with intellectual, individualistic and achievement-oriented values of parents (professional or artistic productivity, moral integrity, ambition) rather than social and conformity-oriented values of parents (dependability).

The same variables were used to predict educational attainment.

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[1] We are grateful to Susan Hopkin for statistical assistance and advice.

Other multiple correlation analyses were carried out, with the scales of the CPI as variables, to predict whether or not the sibling's sister was creative, and with activities from the Childhood Activities Checklist as variables, to predict occupational choice among brothers. The equations selected for presentation are in all cases those which had the highest correlation, using no more than five variables, with each component significantly contributing ($p < .05$).

## GENERAL EFFECTS OF SOME MAJOR VARIABLES

Before the main results are presented, some discussion of the general effects of intelligence, sex of sibling and ordinal position in this sample will be helpful.

### Intelligence

Verbal and mathematical aptitude scores from the Scholastic Aptitude Test (College Entrance Examination Board) were available for the Mills sisters; for the siblings there is only their own comparison of themselves and their Mills sisters on intelligence. The verbal aptitude scores of the Mills sisters are significantly correlated with sibling scores on several of the measures of creative cognitive traits: Art Scale (.41), Complexity of Outlook (.39), Originality (DRS) (.34), Originality (Barron) (.32), all $p < .01$, and Intuition (.27) ($p < .05$). On the CPI, however, the only significant correlate of sister's verbal aptitude was the Socialization Scale (-.34). On the family influences questionnaire, the only significant correlates were having had less self-confidence than the sister as a child (-.27) and attributing to the parents much emphasis on professional or artistic productivity (.27). There were also significant correlations with the siblings' having received scholastic honors (.23) and having chosen a technical or clerical occupation (-.32).

### Sex of Sibling

Comparisons of males and females in the study may be conducted in several ways. All brothers may be compared with all sisters, including or excluding the Mills sisters. Or brothers, all of whom of course have sisters, may be compared only with those sisters who have brothers. Each method of constituting the groups has its biases. For example, when the Mills sisters are excluded, the women Ss lose a large number of bright, confident and individualistic representatives. Furthermore, since girls from families with one girl and one boy are omitted, the sisters come from larger families than the brothers, and more of them are middle children. Nevertheless, the comparisons to be presented will exclude the Mills sister, because much of the family data use her as a reference point, and all brothers will be compared with all sisters of the Mills Ss. We will indicate later how sisters with brothers differ from those with other sisters only, and how inclusion of the Mills sisters can affect the findings from some of the personality inventories.

There were no significant differences between the brothers and sisters in age or in the verbal aptitude or grade-point average of the Mills sister. Brothers had higher educational attainment (Table 1), the difference being attributable to the larger number of brothers who had received, or were working toward, a graduate degree.

On the CPI the brothers had higher scores than sisters on the Dominance Scale, and lower scores on Responsibility and Femininity (Table 1). On the Type Indicator they had lower scores on Feeling (as opposed to Thinking). They had higher scores on General Effectiveness (DRS), but there were no significant differences on measures of creative traits.

On the family questionnaire (Appendix III), one may recall that the siblings rated themselves in comparison with the Mills sister on a number of traits. Brothers rated themselves as having been as children more practical and intelligent than sisters, relative to the Mills sibling, and as less helpful around the home. They rated their esteem from mother and esteem from father, again in childhood and in comparison with the Mills sister, higher than the sisters did. Since a score of 2 indicates "same as Mills sister," one can see from Table 1 where the Mills sister stands in these comparisons. Whereas brothers had felt more stress from their fathers on being ambitious, sisters had felt more stress from their fathers on being tender-hearted and good, companionable and responsive, and well-adjusted.

As mentioned above, the brothers came from smaller families than the sisters, and the sisters include more middle children (Table 1). However, none of the differences between brothers and sisters is significantly related to size of family or to being a middle child.

When the 23 sisters who had brothers are compared with the 16 who were from an all-girl family, most of the differences, from the point of view of creativity, are to the advantage of the former group. The women with brothers had higher scores on Intuition ($p < .05$), Originality (IPAR) ($p < .01$) and General Effectiveness ($p < .05$). On the ACL they had lower scores on Defensiveness and Personal Adjustment ($p < .05$).

However, the Mills sibling from the all-girl family is distinctive, to judge from differences between the sisters from all-girl and mixed families in their comparisons of themselves and their Mills sisters. As a child, the Mills sibling from the all-girl family was more rebellious ($p < .01$), had relatively less esteem from mother ($p < .05$) though somewhat more from father ($p < .10$), and was rated as better-looking ($p < .01$) and more creative ($p < .10$). Of the Mills creatives who had siblings, several of the highest-rated came from families of two or three girls, and we have previously mentioned that many of the creative women mathematicians did also.

## Sibling Position

Correlates for the whole sample of siblings show being an oldest child to be related to the Self-Control, Responsibility, and Achievement via Conformance scales of the CPI. Being a middle child is related to Complexity of Outlook, and being a youngest child is related negatively to Achievement via Conformance, Tolerance, Well-Being, Intellectual Efficiency, Capacity for Status and Self-Control (CPI) ($p < .05$). These differences are certainly influenced by age. Although sibling differences are influenced by age in real life, the nature of the differences in this study is affected by the particular developmental stages of the Ss, the oldest being married and having chosen their life work, the youngest being predominantly single and still in college. Studies of the Mills sisters as college seniors and as alumnae five years later confirmed findings from Vassar women that contentment and adjustment show some increase during this period, though there is little overall change in creative traits (Helson 1967b; Freedman and Bereiter, 1963).

Although the traits associated with ordinal position are in accord with some findings reported in the literature (Sampson, 1965), the relationships

change when the Mills siblings themselves are added to the groups. This is, of course, because the effects of sibling position vary with other characteristics of the individual and his family. Certainly the 6 oldest girls in the sample whose younger sister went to Mills represent a particular type of oldest child adjustment, in which a general overcontrol of impulse seems to be unaccompanied by much positive gain of confidence and pleasure from ego-functioning. For example, on the CPI these women differ from other sisters in higher scores on Responsibility and Self-Control ($p < .01$). They have lower scores on Complexity of Outlook ($p < .01$), Originality (Barron), and Independence of Judgment ($p < .05$).

These oldest girls perceived the differences between themselves and their sibs to be large ($p < .05$) and they reported, as oldest brothers did also, that they had not gotten along well with them. They reported that they had been less influenced by friends than their sisters ($p < .01$). Their fathers were said to stress independence and moral integrity more, and companionability less, than other fathers ($p < .10$).

Although there were oldest girls of this general type who went to Mills, they were a minority. When the Mills Ss are added to the groups, there are no significant differences in personality traits between oldest girls and girls of other sib positions.

The sample is clearly better adapted to the demonstration of a complex of relationships than to the general effects of sibling position.

## FAMILY INFLUENCES ON CREATIVITY

### Resemblances in Personality Among the Mills Creatives and Their Sibs

In 1958 and 1960 the IPAR assessment observers, unaware of which Mills seniors had been designated by faculty as "creative," described the Ss by means of the 100-item Clinical Q-Sort (Block, 1961). The items which were placed highest in describing the creatives were these:

> Has high aspiration level for self.
> Values own independence and autonomy.
> Genuinely values intellectual and cognitive matters.
> Appears to have a high degree of intellectual capacity.
> Is productive; gets things done.

The creatives had higher verbal aptitude scores than other seniors and made better grades ($p < .01$). As alumnae, they made higher scores than their former classmates on most of the measures of creative traits (Table 2). Ratings of activities of the alumnae since graduation indicated that the creatives had shown a higher level of creative activity ($p < .001$). Although almost half of the creatives were by then mothers of young children, the group included a professional pianist, dancer, artist and illustrator, author, several Ph.D. aspirants, several teachers of adult classes in art, music and political science, a communication expert, and a representative in the foreign service.

In the present study, the brothers and sisters of creatives consistently made higher scores than siblings of other Mills women on the indices of creative traits; indeed, they differed very little from their creative sisters (Table 2). They had a higher educational level ($p < .01$) than the siblings of comparison Mills women, and the brothers had received more honors for intellectual distinction ($p < .01$) than other brothers. Three older brothers and a twin were engaged in research in physics, engineering or biology; another older brother was in public relations work. Four younger brothers were graduate students, or about to begin graduate work, in law, medicine, political science, and education; one youngest brother hoped to be an "entertainer." Of three sisters of creatives who were the younger of two children, one was studying architecture, one drama, and the third had married and was working as a social research analyst. Of the six other sisters, three were housewives and three were undergraduates.

To investigate further the creativity of the siblings of the creatives, multiple correlations were computed to predict status as brother or sister of a creative on the basis of sibling scores on the CPI.

Work by IPAR investigators has indicated that creative male adults give CPI profiles characterized by high scores on scales indicative of drive and spontaneity (class I), low scores on scales indicative of conformity and regulation of impulse (II), and high scores on scales tapping intellectual interest, openness and effectiveness (III). (See Proceedings of the Conference on "The Creative Person," 1961, and Hall and MacKinnon, 1965.) Findings by Parloff, Datta, Kleman and Handlon, interpreted in relation to the IPAR findings, show that creative 18-year-old males who were planning to

enter scientific fields made high scores in all three of these areas. Scales which showed the highest relationship with creativity in these young men were Social Presence (I), and Achievement by Independence, Psychological Mindedness and Intellectual Efficiency (III).

In CPI data for men, being the brother of a creative showed a correlation of +.52 with the Psychological Mindedness Scale (III), +.49 with Social Presence (I), +.46 with Tolerance (II) and +.40 with Intellectual Efficiency (III). A multiple correlation of +.79 was achieved with the following variables: Psychological Mindedness, Social Presence, and Socialization, weighted positively, and Sociability and Achievement via Conformance weighted negatively (Table 3). This equation puts main emphases on intellectual openness and effectiveness (Psychological Mindedness) and on self-confidence and spontaneity (Social Presence). The other terms suggest a patterning in which there are social roots (Socialization) but an inclination for independent individual activity (low Sociability and low Achievement by Conformance).

A similar multiple prediction analysis was done with the CPI data obtained from sisters. In evaluating the results, there are two disadvantages: first, that the sisters of the creatives had an average age of 22.6 whereas the other sisters had an average age of 26.8 and were more frequently married; second, that no previous results for a large sample of creative women are available. The creative sisters at Mills had differed from other Ss on the Psychological Mindedness and Flexibility scales (III). In the sample of adult women mathematicians the creative Ss differed from comparison Ss in having higher scores on Flexibility (III) and lower scores on Communality and Achievement via Conformance (II) (Helson, 1967). These results suggest that the creative profile for women may be similar to that for men but without high scores on the scales of Group I.

In this study, being the sister of a creative showed only one significant correlation, -.39 on the Well-Being Scale. The best multiple prediction equation yielded a correlation of .51 with a negative weighting of scores on Well-Being and a positive weighting of scores on Achievement by Conformance (Table 3). Since these findings may be affected by the different developmental status of the sisters of the creatives, their scores were compared with those of the Mills women at the time they were seniors in college. What differences there are still suggest that the sisters of the creatives are lacking in confidence and forcefulness.

As shown in Table 2, the younger sisters of the creatives had higher scores than sisters of other Mills women on Verbal Originality and Complexity of Outlook. They had higher scores than the brothers of creatives on the Art Scale ($p < .05$). However, they also had lower scores than the brothers on General Effectiveness, Dominance, Well-Being and Psychological-Mindedness ($p < .05$).

The brothers of the creatives did not differ significantly on any of these latter scales from their creative Mills sisters; they did have higher Self-Acceptance scores than their creative sisters ($p < .05$), as compared with other brothers and their sisters. On the Gough-Heilbrun scales for the ACL, they had higher scores than their creative Mills sisters on the ACL Scale, Order ($p < .05$).

Family Values

As seniors, the Mills creatives had described their parents as having intellectual or artistic interests and the fathers in particular as being men of principle or moral integrity (Helson, 1967b). Asked whether the parents had emphasized achievement, the most common answer of the creatives was "Oh no, I wanted to do well myself." Reports from their mothers suggested that achievement was indeed important to the family but that this value had been successfully taken over by the child. "We may have overemphasized it," or "Its importance was taken for granted in the family," several mothers said.

Data from the Study of Values (Allport, Vernon and Lindzey, 1951) for a sample of fathers showed the fathers of creatives to have stronger Theoretical values and weaker Political values than fathers of other Ss. In ranking the same set of traits that was given to the siblings in this study, they attached more importance than other fathers to moral integrity as a desired quality in their Mills daughters. Mothers of creatives did not differ significantly from other mothers (Helson, 1967b).

In the present study, the brothers of the creatives, as compared with other brothers, said that their fathers laid greater stress on moral integrity, and also that their mothers attached less importance to ambition ($p < .05$) and masculinity ($p < .10$). There were no significant differences between sisters of creatives and other sisters in their ratings of parental values. An overall view of some of these data is shown in Table 4.

Role and Status in the Family

In comparison with other Mills Ss, most of whom had been closer to their mothers than to their fathers in childhood, the creatives usually reported ties of about equal closeness with each parent (Helson, 1967b). Unfortunately, the Mills Ss were not questioned systematically about childhood relationships with their siblings.

Parents were asked, by questionnaire, what effect their daughter's position in the family, as oldest, youngest, only girl, etc. had had on her development. Many parents did not answer this question, even though there was other evidence that sibling rivalry had been a problem. Others gave replies too bland to be meaningful. Here, however, are some illustrative replies from parents of creatives and comparison Ss of two sibling positions.

Parents of creatives who were oldest children:

As she was our first-born, I'm afraid we were too demanding, over-concerned and perfectionistic with her.

As first child, she was held up as a fine example. Also given a great deal of responsibility. I think she feels we were stricter with her than with the others, and that is quite true.

Being a first child, she was at the mercy of inexperienced parents at a period when progressive child-development was urged. Her younger brother soon grew bigger than she and he was completely independent, so that she had

no outlet for her enormous capacity for mothering people and protecting them from injustice.

She saw herself as an adult while still a child. She identified with her father and me instead of with her younger sister.

Parents of comparison Ss who were oldest children:

She would have been spoiled without her sister. Her sister did a great deal to restore her perspective.

As eldest and the only girl, she had her mother's help to "have everything," fine wardrobe, etc. It was a serious blow to her when she found her brother had a higher IQ than she.

Having a brother gave her the opportunity to develop a balanced personality--away from being self-centered. Though fond of her brother, she sometimes wished she had a sister.

As the eldest of three children, she showed her sense of responsibility at an early age in looking after the others, and I think this continued to develop.

I believe being the oldest made her feel more important, and more secure.

Parents of creatives who were second children with older brother and younger sister:

Her older brother was her ideal. When her younger sister was born, she said, "I think we have enough babies now."

Her respect for her older brother spurred her on too much. Her jealousy of her younger sister and mother showed us her need of affection and attention.

She looked up to her older brother and wished to be praised and accepted by him. He was likely to tease her just to get a reaction and this persisted for years.

Parents of comparison Ss who were second children with older brother and younger sister:

She felt competition from a very bright brother above and an equally bright sister below. She is bright, too, but tends to undervalue herself.

As the elder daughter but second child, she had to learn patience, self-reliance, obedience and forbearance. Her younger sister was outstanding in beauty and personality and drew more attention, so that I think she was lacking in social confidence.

She did not get along with her older brother. She still likes people, but she likes interesting, unusual people.

The present study gives the point of view of the siblings about relationships within the family. In contrast to other brothers, the brothers of creatives thought they had been taken less seriously by their parents than their Mills sister in childhood (Table 5). Again in contrast to other brothers, they did not rate themselves as having been more practical than their sister nor as having had stronger interests ($p < .05$).

In comparison with other sisters, the sisters of creatives rated themselves as having been more congenial with their mothers than the Mills sister (Table 5) and as having been less self-confident ($p < .05$). They rated themselves as having been somewhat less strong in personality and felt they had been treated differently with different expectations by their parents ($p < .10$). In this last respect, and also in greater congeniality with mother, they differed significantly from the brothers of the creatives (Table 5).

Prediction of being the sib of a creative from family data

The best multiple prediction equations, using parental values and role and status variables, are shown in Table 6.

The equation for brothers gives most weight, negatively, to parents took me more seriously. There is positive weighting of father's stress on moral integrity and on professional or artistic productivity, and negative weighting of mother's stress on ambition. These four variables yield a multiple correlation of .73.

The sister's equation puts a negative weight on self-confidence and a positive weight on parents treated us differently with different expectations. Since this best equation yields a multiple correlation of only .47, it again appears that there is more heterogeneity within the groups of sisters of creative and comparison Mills Ss than there is within the two groups of brothers.

Discussion

The creatives and both their brothers and sisters show the pleasure in the potential, the intellectual and the new and different that seems generally to characterize the creative person. There is in the family background the combined emphases on the intellectual and on the moral or ethical which the Goertzels (1962) found common in the parents of the eminent. The parents seem not to have differentiated much according to sex role, at least between the first girl and boy. That the brothers of the creatives may have found this hard to take is suggested by their extreme scores on "our parents took (her) more seriously." With the second daughter the parents seem to have relaxed a bit, the mother in particular seeking a more personal and companionable relationship.

If we conclude that the creatives and their brothers give evidence of a creatively productive personality organization, in comparison with their peers, and that the sisters do not, the findings on family relationships are roughly in accord with expectation. Both the brothers and the Mills sisters had a "nonadapted" position in the family, as indicated most clearly in

"parents took (the creative sister) more seriously" and the lesser congeniality with mother. The nonadapted relationship presumably came not only from the competition of the sib(s) but also from the somewhat stern and idealistic values of the parents. Attribution to the father of stress on moral integrity shows a significant correlation (.27), for the whole sample of sibs, with the Mills sister's criticality in describing her parents. The combination of father's stress on moral integrity and professional productivity and mother's low stress on ambition would seem to encourage a very high-minded integration on the part of the child.

Besides the strain in affectional relationships, which does not appear to have been extreme in most cases, both the creatives and their brothers gave evidence of the intuitive, non-practical outlook which was hypothesized to connote an ability to gain gratification by symbolic means. The creatives had higher verbal aptitude scores than their classmates, and the educational attainment and scholastic honors of their brothers would seem to indicate that they also had considerable symbolic facility.

Finally, the values of the parents were such that individualistic intellectual achievement would be expected to bring esteem.

The younger sister's experience was different in that she was (usually) unchallenged by a new sibling, in no case by a younger sister, and perhaps for this reason remained closer to the mother. Her parents treated her differently and expected different things of her. Among these differences was apparently less expectation of the somewhat masculine character development implied in "moral integrity." The younger sister developed the complexity of outlook, verbal originality and independent judgment of the others, but she lacked other ingredients of the creative motivational pattern. Confidence was one of these, but more generally it was the need to gain independence of affectional deprivation by autonomous symbolic manipulation and the rewards that it brought.

Several of the creatives are now housewives with young children; others are feeling the pressures of marriage and work. That the creative sister lost some of her confidence and sense of direction is suggested by the difference between her and her brother on the Self-Acceptance Scale. In a study of men and women mathematicians (Helson, 1957a) an analysis of variance of CPI data yielded a significant interaction between sex and creativity on the Self-Acceptance Scale ($p < .01$).

## FAMILY INFLUENCES ON EDUCATIONAL ATTAINMENT

In theory, educational attainment would be expected to indicate an effective intellectual orientation but not necessarily originality or creativity. In this sample, however, educational attainment was significantly correlated with most indices of creativity: for example, there were correlations above +.40 with Independence of Judgment, Complexity of Outlook, Originality (Barron) and Psychological Mindedness. It was highly correlated also with General Effectiveness (+.40). On the Type Indicator, educational attainment was correlated positively with Intuition (+.30) and negatively with Extraversion (-.28).

Educational attainment was higher for brothers than for sisters, as previously reported. It was not correlated significantly with verbal or mathematical aptitude of sister, but it was correlated with regarding oneself as more intelligent than one's sister (+.36), and also with having a creative as a sister (+.30).

Correlates from the family relationships questionnaire showed educational attainment to be related to having had less personality than the Mills sister in childhood (-.24) but stronger initiative (+.36), creativity (.+26) and school achievement (+.53). There were also positive correlations with esteem from mother (+.36) and father (+.29) in childhood, and with father's stress on professional or artistic productivity (+.30) and ambition (+.24).

A multiple correlation of .59 with educational attainment is achieved with positive loadings on intelligence, esteem from mother and strong interests, in comparison with sister, and negative loadings on father's emphasis on dependability and on strength of personality and charm, in relation to sister (Table 7).

These results support the idea that educational achievement was a route established in childhood whereby a child with a relative advantage in intellect and some relative disadvantage in personal interaction obtained parental esteem and symbolic gratification.

In the data from brothers a multiple correlation of .70 with educational attainment is achieved with these variables: positive loading on self-rating as more intelligent than sister and as having had stronger interests than sister; negative loadings on having been more practical, having had more personality and having been treated differently by parents, with different expectations (Table 7). Having been less practical than sister has the heaviest weight. For all sibs combined, this variable has a correlation with educational attainment of .02, but for brothers the correlation is -.35.

It may be recalled that brothers had higher scores than sisters on being more practical than the Mills sister (Table 1). The practical orientation, as opposed to the intuitive, was hypothesized to be negatively related to the ability to gain pleasure from symbolic manipulation and hence from creative activity. The practical or technical orientation seems to be a greater handicap to creative personality development in men than in women, as data presented by Heist indicate also (1962).

## COMPLEXITY AND EFFECTIVENESS: SOME VARIABLES RELATED TO DIFFERENCES AMONG SIBLINGS

The creatives and their brothers, and also the siblings with high educational attainment, have been characterized by both a sensitivity to the potential and complex and an effectiveness in pursuing their objectives. The creative process is frequently described as a synthesis of "opposites" like these--a great emotion and a great order (Coleridge) or a sensitivity "almost incompatible" with the firmness of character (Hawthorne). Sex differences in creative style seem to be associated with a differential weighting of these two characteristics or aspects of the creative process (Helson, 1967a).

The Complexity of Outlook (CO) and General Effectiveness (GE) scales were chosen as indices of these two characteristics, with the purpose of inquiring into the family context of each.

In the sample of siblings scores on both of these scales were correlated with educational attainment (+.40, +.42). Both show correlations above .40 with Achievement by Independence and Psychological Mindedness (CPI). From a person who is effective at a high level of complexity, one would expect high scores on both of these scales. Yet, there are "incompatibilities." CO and GE have correlations significant in opposite directions with Well-Being and Good Impression, and whereas scores on GE are highly correlated (+.40 or above) with Capacity for Status, Sociability, Achievement by Conformity and Intellectual Efficiency, none of these scales is significantly correlated with CO.

On CO, males and females did not differ, though middle children had higher scores than Ss of other ordinal positions ($p < .05$). CO scores were correlated with an occupational choice that was professional (other than scientific) (+.44); with verbal aptitude of sister (+.39); and with whether the sister was creative (+.25). On GE, brothers had higher scores than sisters ($p < .01$), but scores were not correlated with occupational choice, scholastic aptitude, or whether sister was creative. Whereas there was a correlation of +.53 between scores of sib and sister on CO, the correlation was only +.12 on GE. It would appear, then, that CO varies with verbal intelligence and perhaps with family disposition to intellectualize and brood, whereas GE varies with sex and/or with role and status in the family.

Among the family relationship variables, scores on CO showed no significant correlations in the entire sample of siblings, brother and sister together. Neither did the difference between sibling's score and sister's score. Among brothers alone, however, being higher than one's sister in CO was highly correlated with congeniality with mother (+.54) and with having been less practical than one's sister in childhood (-.48). Among sisters, there were no significant correlations with difference from one's sister on CO.

The relation between congeniality with mother and CO in brothers is consistent with findings by Sharaf (1959), which show intraceptive college men to have been close to their mothers in childhood. The role of mother's confidant was frequently accompanied by feelings of disloyalty to the father and and by insecurity in the masculine role.

As previously shown in Table 2, both the creatives and their sisters had higher scores on CO than comparison women, but the difference between brothers of creatives and other brothers is not significant.

Scores on General Effectiveness were correlated in the whole sample of siblings with the sibling's having shown more initiative (+.41), self-confidence (+.41) and intelligence (+.37) than the Mills sister in childhood, and having had more esteem from father (+.38). The difference between sib and sister in GE was greater in the case of brothers than of sisters ($p < .01$), and family background correlates of differences between sib and sister vary with sex. Among brothers, being higher than the Mills sister was highly correlated (+.54) with paternal stress on professional or artistic productivity. Among sisters, being higher on GE than one's sister was correlated with esteem of father (+.38) and attributing to one's father relatively little stress on moral integrity (-.39).

Without overinterpretation of these results, which would seem to be related to the particular characteristics of the sample, it does seem evident that GE is related to characteristics of the father and to the child's relationship with him. The findings are consistent with the idea that "effectiveness"is more likely to accompany creative traits in men than in women. In this sample, the brothers of creatives stand out from all other Ss, male and female, including their sisters, with a mean score on GE of 26.7. Other groups differ very little from each other around a mean of 23.6 (Table 2).

Table 8 shows the correlations between scores of Mills sister and sibling on several measures of creative cognitive traits and achievement-motivation. The former show higher correlations than the latter, suggesting that achievement-motivation and effectiveness are more influenced by sex and/or by role and status within the family. The correlation between scores of siblings on the creative cognitive traits is generally higher than the correlation between the Mills sister's score and her own verbal aptitude score on the Scholastic Aptitude Test. It would appear that the measures of creative cognitive traits reflect family resemblances which are not accounted for by intelligence alone. The next section will have material to bear on this subject.

# CHILDHOOD INTERESTS AS AN EXPRESSION OF FAMILIAL AND INDIVIDUAL DISPOSITIONS IN EMOTIONAL EXPRESSION AND COGNITIVE STYLE

## Imaginary and artistic interests

Strong symbolic interests have been conceptualized as an expression of the creative child's motivation to achieve esteem of his parents and at the same time emotional independence and autonomous self-expression. In earlier work it was found that a high proportion of creative women reported having had strong imaginary and artistic (IA) interests in childhood (Helson, 1966). At both the University of California and Mills College, women who had high scores on the IA index, derived from scores on the Childhood Activities Checklist, were characterized by mistrust in personal relationships, impulsivity, rebelliousness and investment in inner life. At Mills they had higher scores than other women on verbal aptitude and on all of the measures of creative cognitive traits. These measures contain items which tap the acceptance or awareness of the unorthodox or unpleasant, and of course such awareness appears to characterize many creative persons.

The earlier work showed that the parents of women with strong IA interests had some of the same traits as their daughters. In self-descriptions on the ACL, both mothers and fathers had lower scores than other parents on the Gough-Heilbrun scales for Defensiveness, Affiliation, and Number of Favorable Adjective Checks. The ACL Manual describes low-scorers on this last scale as individualistic, clever, original and as having free access to their emotions. There was sometimes considerable emotional stress in these families, to judge from the fact that high-scorers on the IA index more often than their classmates had lost a parent in childhood by death, divorce or separation ($p < .01$).

We are now interested in whether the brothers and sisters of these women show the same personality characteristics, what kind of interests they had in childhood, and whether many of them appear to be creative individuals.

In sibling position, high-scorers on the IA index did not differ from other Ss, but they did come from smaller families. Their brothers and sisters show characteristics similar to their own and to those of their parents (Table 9). Scales of the ACL which show two or more significant results in the samples of Mills sisters, siblings, mothers and fathers are as follows: Defensiveness, Number of Favorable Adjectives, Self-Control, Personal Adjustment, Nurturance and Affiliation, all relationships being negative; and Aggression and Change, all relationships being positive.

The siblings in the IA families do not resemble one another in all respects. In comparison with other siblings, brothers and sisters of high-scorers on the IA index had higher scores than their Mills sister on Achievement via Conformance (CPI). They rated their sister as having been more rebellious and self-confident in childhood. Furthermore, the IA index score of the Mills sister was not significantly correlated with the IA index score of the sibling sister; the Mills sister's IA index score showed correlations only with activities from the Childhood Activity Checklist which her sister had enjoyed less in childhood than other sisters--cooking, playing cops and robbers, and playing with siblings ($p < .05$). Brothers of high-scorers on the IA index liked collecting things, writing poems and stories, and reading ahead in school

subjects ($p < .05$). For neither brothers nor sisters, however, were IA index scores of the Mills sister correlated with their own educational attainment or intellectual honors; in the whole sample these correlations were +.02 and +.03 respectively. Yet the correlation with whether the sister was creative was +.41.

It appears, then, that family style in expressing or accentuating discordant impulsivity contributes to the resemblance among siblings on measures of creative traits, but that the siblings in these families vary considerably in their educational achievement and probably their creative achievement. The previous work showed that high-scorers on the IA index who were regarded by the Mills faculty as creative differed from other women with high scores in having even stronger imaginary and artistic interests, more need for autonomy, less tendency to scatter their energies in impulsive behavior or in social interaction, higher verbal aptitude, and more involvement in the role of creative person. The findings of the present study suggest that similar variables may differentiate among the siblings.

Some interest patterns in brothers

In the absence of cluster analyses of childhood interests for a large sample of men, the procedure in this study was to do multiple predictions of occupational choice of brothers, using the childhood activities as variables. The best equations to predict choice of a scientific profession, a profession other than scientific, and a career in business are shown in Table 10.

Brothers who chose a scientific profession were identified by their liking for childhood activities which were individual and intellectual or artistic but highly structured--photography, writing poems and stories, playing musical instruments. They did not enjoy playing ball or a freer or more dramatic type of imaginary play (creating imaginary situations and acting in them.)

Other activities which were not selected by the multiple prediction program but which showed significant correlations with choice of a scientific profession were building models to fly, run, etc. (+.36), taking apart clocks, radios, motors (+.33), and playing alone (+.33); negative correlations were obtained for catching lizards, butterflies, etc. (-.36) and playing chess (-.41).

Brothers who chose a profession, but one that was not scientific in nature, were easily identified on the basis of their childhood activities. Most of these young men were lawyers, or studying law, but there were also several Ss in various academic fields outside of the sciences, and one or two others. More than other boys, these had enjoyed activities that were artistic and dramatic (putting on shows; drawing, painting or working with clay; building models to fly). They did not care for non-dramatic physical activities (hiking, exploring or prowling).

Other activities which showed significant correlations with this career choice, though not included in the multiple prediction equation, were creating complex imaginary situations and acting in them (+.37), being the leader of your class or gang (+.35), and (negative) riflery (-.40) and climbing trees (-.38).

Brothers who chose business were identified as having enjoyed having a boy over for the day and as having received relatively little pleasure from reading, building models to fly, and especially going around with the neighborhood bunch. Why this last activity should have such a high negative loading is not clear. The "business" category includes men who are quite diverse--real estate salesmen, district managers, proprietors of small businesses--and they are being compared primarily with men of higher educational attainment.

## SUMMARY AND DISCUSSION

To review briefly the design of the study, young adult Ss furnished personality inventory data together with questionnaire information about family influences in their childhood--the values of their parents and comparisons of themselves with their sisters. About these sisters there was considerable information from previous investigations. Some of them had been evaluated by their Mills College faculty as creative, with substantiation from IPAR data and a post-college follow-up. Data obtained from parents of a subset of the college women were presented in conjunction with the reports from the siblings.

We were not primarily interested in showing characteristics associated with sex of sibling or with ordinal position per se. The effects of these variables differed from one subsample to another. For example, among the brothers and sisters of the Mills Ss, there was an association between being a brother, having felt greater parental stress on ambition, having had greater parental esteem in childhood and having greater drive and direction as a young adult. Yet, if the Mills sisters are included in these analyses, most of the differences are reduced or disappear. The findings thus seem to make two points at once: they fill in family relationships and emphases which conform to the general outline of sex role stereotypes as these relate to achievement, but they also indicate the many deviations from the modal pattern.

The main concern of the study was to show a patterning of variables which was hypothesized to be predictive of creative achievement. This pattern was derived from the formulation of the creative personality by Rank (see MacKinnon, 1965). It was said to involve (1) a position of dissatisfaction in the family together with (2) the intellectual ability to manipulate symbols and to derive vicarious satisfaction from symbolic play and (3) the expectation that original intellectual achievement would reduce the dissatisfaction. According to this conceptualization, a creative child would be more intelligent and intuitive than other children, would have experienced some deprivation in family relationships, and would attribute to his parents a respect for intellectual achievement. He would be expected to develop over time strong self-rewarding symbolic interests, to show confidence in his intellectual effectiveness, and to manifest creative accomplishments.

We have not been able to measure each of the hypothesized variables in pure form. For example, it seems likely that what the parent values for the child depends in part on the characteristics already demonstrated by the child. However, there was considerable evidence that both the creative women and their brothers showed all parts of the above pattern, whereas the younger sisters showed only the intellectual receptivity.

The creative women whose siblings were represented in this sample were all either oldest children or second children with older brothers. Both the creatives and their brothers had experienced stress in sibling relationships along with demanding and idealistic parental values. Like their Mills sisters, the brothers gave much evidence of having productive creative personalities. In this respect, they showed no signs of having suffered from the greater amount of attention which they felt their Mills sisters had received. The lack of emphasis on sex-role differentiation in their families may indeed have had a part in the lesser "practical" orientation, which differentiated these brothers from other brothers.

The sisters of the creative women in the sample were all younger or youngest children; they experienced a more congenial relationship with the mother and were treated differently by the parents, with less apparent emphasis on personal autonomy and achievement. They seem not to have had the self-confidence of their sisters, and not to have developed any particular cathexis of the social role of creative person.

In this sample, the pattern of family influences which predicted educational attainment was similar to that which was associated with creativity, that is, some disadvantage in personal relationships within the family, an advantageous position with respect to intelligence, strong interests in childhood, and esteem from parents who were not conformity-minded. Educational attainment showed high correlations with creative traits.

Separate study was made of Complexity of Outlook and General Effectiveness, which were taken to represent two aspects of the creative process. Complexity of Outlook was related to verbal aptitude and to occupational choice; among brothers having more Complexity of Outlook than one's sister was related to having a more congenial relationship with mother. General Effectiveness was related to being male and to having had more initiative, confidence, intelligence and esteem from the father than one's sister.

In the sample generally, scores on measures of creative cognitive traits showed higher correlations between siblings than scores on measures of achievement-motivation and effectiveness. For example, the correlation between siblings on Complexity of Outlook was .53, on General Effectiveness, .12.

The resemblance between siblings on measures of creative traits depends partly, one presumes, on inherited factors of intelligence. It depends also on familial disposition to accentuate or suppress emotional discord. Women who had strong imaginative and artistic interests in childhood had siblings who made high scores on the creative cognitive traits and (as parents of these women had done also) showed low defensiveness and related personality traits on the ACL.

In comparison with their sisters who had strong symbolic interests, however, these siblings tended to have been less rebellious and less confident as children and to have higher scores on Achievement by Conformity as young adults.

Certain patterns of childhood activities were associated with occupational choice among brothers. Men who went into science reported having liked activities which were individualistic, analytically intellectual, or artistic but highly structured. Men who went into a non-scientific profession were distinguished by interests which involved a freer or more dramatic type of imaginary play.

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Table 1

Comparisons of Brothers and Sisters of Mills Women on Personality Traits and Family Influences

| | Brothers N = 36 | | Sisters N = 40 | | |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t |
| Personality Scales | | | | | |
| Dominance (CPI) | 32.4 | 6.1 | 27.7 | 5.9 | 3.03** |
| Responsibility (CPI) | 31.0 | 4.6 | 33.3 | 3.6 | -2.24* |
| Femininity (CPI) | 16.8 | 6.4 | 23.4 | 2.6 | -5.72** |
| Feeling (Type Indicator) | 7.7 | 5.4 | 11.8 | 5.0 | -3.11** |
| General Effectiveness (DRS) | 24.7 | 2.9 | 22.7 | 3.5 | 2.33* |
| Educational Attainment | 3.5 | 1.1 | 3.0 | .9 | 2.17* |
| Comparisons with Mills Sister in Childhood[a] | | | | | |
| Helpful around home | 1.6 | .6 | 2.2 | .8 | -4.20** |
| Practical | 2.4 | .6 | 2.0 | .7 | 2.72** |
| Intelligent | 2.0 | .6 | 1.6 | .6 | 2.20* |
| Esteem from mother | 2.1 | .6 | 1.8 | .6 | 2.04* |
| Esteem from father | 2.1 | .4 | 1.8 | .5 | 2.33* |
| Values Stressed by Father in Childhood | | | | | |
| Ambitious | 2.4 | .7 | 1.9 | .9 | 3.14** |
| Companionable, responsive | 1.3 | .6 | 1.7 | .8 | -2.25* |
| Tender-hearted, good | 1.3 | .6 | 1.8 | .7 | -3.00** |
| Well-adjusted | 1.7 | .7 | 2.0 | .9 | -1.98 |
| Family Composition | | | | | |
| Number of children | 2.9 | .8 | 3.3 | .9 | -2.05* |
| Middle child or not | 1.2 | .4 | 1.4 | .5 | -2.21* |
| Age | 25.2 | 4.8 | 25.1 | 4.2 | .10 |
| Verbal aptitude of sister | 521.7 | 81.8 | 541.4 | 89.4 | -.99 |
| Mathematical aptitude of sister | 476.3 | 70.5 | 492.7 | 84.6 | -.91 |
| Grade-point average of sister (Rank) | 5.4 | 2.0 | 5.6 | 1.8 | -.52 |

[a] A score of 2 indicates no difference between sib and sister.

** $p < .01$ (two-tailed test)

* $p < .05$

Table 2

Creatives, Comparison Ss, Brothers and Sisters:
Scores on Indices of Creative Traits and Other Personality Scales

| | Creatives & Their Sibs | | | Other Mills Ss & Their Sibs | | |
|---|---|---|---|---|---|---|
| | Mills Ss N = 22 | Brothers N = 6 | Sisters N = 9 | Mills Ss N = 77 | Brothers N = 15 | Sisters N = 25 |
| Complexity of Outlook | 30.0* | 26.7 | 28.6* | 24.8 | 24.1 | 22.5 |
| Independence of Judgment | 14.9* | 14.7 | 15.3[a] | 13.2 | 13.1 | 12.6 |
| Originality (Barron) | 49.0[a] | 52.3* | 48.9* | 45.5 | 44.0 | 40.5 |
| Originality (IPAR) | 27.0 | 26.0 | 24.0 | 25.8 | 24.1 | 22.7 |
| Originality (DRS) | 68.0[a] | 68.7[a] | 66.4 | 64.1 | 60.9 | 62.7 |
| Intuitiveness | 19.2* | 19.3* | 18.3[a] | 15.8 | 11.8 | 13.4 |
| Art Scale | 35.9* | 24.3 | 33.4 | 29.2 | 21.2 | 27.3 |
| General Effectiveness | 24.1 | 26.7[a] | 23.4 | 23.8 | 24.0 | 23.0 |
| Psychological Mindedness | 14.5[a] | 15.2* | 12.3 | 13.3 | 12.8 | 12.2 |
| Flexibility | 15.5* | 13.2 | 14.1 | 13.2 | 11.9 | 12.8 |

NOTE: One sibling per family is included in each group, and brothers have been equated in age and sibling position. Scores given for Mills Ss are those from the alumnae study.

[a] Difference significant beyond .10 level of confidence.

* Difference between groups in corresponding columns (from families of creatives and comparison Ss), significant beyond .05 level of confidence, two-tailed t-test.

Table 3

Multiple Prediction of Status as Sibling of Creative Sister
Using CPI Scales as Variables

| Brothers | | Sisters | |
|---|---|---|---|
| Variable | Beta Coefficient | Variable | Beta Coefficient |
| Psychological mindedness | .94 | Well-being | -.69 |
| Social presence | .69 | Achievement via conformance | .49 |
| Achievement via conformance | -.61 | | |
| Socialization | .53 | | |
| Sociability | -.43 | | |
| Multiple correlation: .79<br>F (5, 18) = 8.77 | | Multiple correlation: .51<br>F (2, 30) = 6.61 | |

NOTE: One brother or one sister from each family is included in the analysis.

Table 4

Values Most Stressed by Parents for Child

| | For Mills Ss[a] | For Brothers[b] | For Sisters[b] |
|---|---|---|---|
| Parents of Creatives | | | |
| Fathers | Having moral integrity** | Having moral integrity* | Having intellectual curiosity |
| Mothers | Having moral integrity | Having moral integrity | Being tender-hearted, good |
| Parents of Other Women | | | |
| Fathers | (Tie) Being well-adjusted, having intellectual curiosity and moral integrity | (Tie) Being dependable and ambitious | (Tie) Being dependable and self-reliant |
| Mothers | Being well-adjusted | Being dependable | Being dependable |

[a] Data furnished by parents.

[b] Data furnished by siblings.

** $p < .01$ Fathers of creatives vs. fathers of other Mills assessment Ss.

* $p < .05$ Brothers of creatives vs. brothers of other Ss.

Table 5

Comparisons between Siblings and Mills Sister
in Relations to Parents

| | Mean | SD | t | |
|---|---|---|---|---|
| Our parents treated us differently, with different expectations. | | | | |
| a. Brothers of creatives | 1.33 | .82 | 2.20* | (a. vs. b.) |
| b. Sisters of creatives | 2.38 | .92 | 1.92 | (b. vs. d.) |
| c. Other brothers | 1.79 | .98 | | |
| d. Other sisters | 1.64 | .95 | | |
| Our parents took me more seriously. | | | | |
| a. Brothers of creatives | 1.17 | .41 | 3.23** | (a. vs. c.) |
| b. Sisters of creatives | 1.63 | .92 | | |
| c. Other brothers | 2.00 | .75 | 2.59* | (c. vs. d.) |
| d. Other sisters | 1.36 | .57 | | |
| I was more congenial with mother. | | | | |
| a. Brothers of creatives | 1.67 | .82 | 2.31* | (a. vs. b.) |
| b. Sisters of creatives | 2.50 | .53 | 2.77** | (b. vs. d.) |
| c. Other brothers | 2.05 | .78 | | |
| d. Other sisters | 1.72 | .74 | | |

NOTE: Each group includes no more than one sibling per family. Brothers have been equated in age and sibling position. A score of 2 means "same as Mills sister."

** $p < .01$ (two-tailed test)

* $p < .05$

Table 6

Multiple Prediction of Status as Sibling of Creative Sister
Using Family Influence Variables

| Variable | Beta Coefficient |
|---|---|
| **Brothers** | |
| Our parents took me more seriously. | -.47 |
| Father stressed moral integrity. | .40 |
| Father stressed professional or artistic productivity. | .30 |
| Mother stressed ambition. | -.29 |
| Multiple correlation: .73<br>F(4,25) = 9.38 | |
| **Sisters** | |
| I was more self-confident. | -.44 |
| Our parents treated us differently with different expectations. | .34 |
| Multiple correlation: .47<br>F(2, 31) = 5.73 | |

NOTE: One brother or one sister from each family is included in the analysis.

Table 7

Multiple Prediction of Educational Attainment
Using Family Influence Variables

| Variable | Beta Coefficient |
|---|---|
| **All Siblings** | |
| I was more intelligent than sister | .34 |
| I had more esteem from mother. | .30 |
| Father stressed dependability. | -.27 |
| I had more personality. | -.23 |
| I had stronger interests. | .21 |
| Multiple correlation: .59<br>F (5, 70) = 9.19 | |
| **Brothers** | |
| I was more practical than sister. | -.53 |
| I was more intelligent. | .44 |
| I had more personality. | -.39 |
| I had stronger interests. | .32 |
| Our parents treated us differently with different expectations. | -.31 |
| Multiple correlation: .70<br>F (5, 30) = 7.78 | |

Table 8

Traits Related to Creativity and Achievement: Correlations between Scores of Siblings and between Sister's Score and Verbal Aptitude

| | r between Scores of Siblings | r between Mills Ss' Scores and Verbal Aptitude |
|---|---|---|
| Complexity of Outlook | .53** | .44** |
| Intuition | .52** | .35** |
| Independence of Judgment | .42** | .30** |
| Originality (IPAR) | .35** | .21* |
| Originality (Barron) | .30** | .47** |
| Originality (DRS) | .22 | .42** |
| General Effectiveness | .12 | .09 |
| Psychological Mindedness | .07 | .16 |
| Achievement by Conformance | .00 | -.08 |
| | N = 62 | N = 99 |

NOTE: In these data, some of the Mills Ss' scores are overrepresented since they are paired with scores of more than one sibling. A more accurate estimate of the true value of the relationship between scores of siblings would be obtained by intraclass correlation and analysis of variance. However, for a sample size of 62 the correction factor is negligible. See Fisher, 1954.

** $p < .01$
* $p < .05$

Table 9

Similarities and Differences in Personality Traits in Families of Women with Imaginative and Artistic Interests

| | Relationships with IA index score of Mills Ss | | | |
|---|---|---|---|---|
| | Mills Ss | Siblings | Mothers | Fathers |
| | r | r | t | t |
| **Indices of creative traits** | | | | |
| Complexity of Outlook | .44** | .29* | -- | -- |
| Originality (Barron) | .28* | .26* | -- | -- |
| Independence of Judgment | .30** | .30* | -- | -- |
| **Scales from ACL** | | | | |
| Defensiveness | -.38** | -.41** | -2.47* | -2.00 |
| No. of favorable adjectives | -.18 | -.49** | -3.93** | -2.00 |
| Self-Control | -.32** | -.39** | -1.01 | -1.06 |
| Personal Adjustment | -.34** | -.31* | -2.52* | -1.99 |
| Nurturance | -.22 | -.42** | -5.22** | - .35 |
| Affiliation | -.24 | -.46** | -3.92** | -2.08* |
| Aggression | .17 | .47** | 2.57* | .62 |
| Change | .30** | .31* | -1.58 | - .03 |
| **Comparisons with Mills sister** | | | | |
| Achievement via Conformance (CPI) | | .35** (Sibling higher) | | |
| Rebelliousness (Questionnaire) | | -.30* (Mills sister higher) | | |
| Self-confidence (Questionnaire) | | -.35** (Mills sister higher) | | |
| **Creative status of Mills sister** | | .41** | | |
| | N = 76 | N = 62 | N = 38 | N = 33 |

** $p < .01$
* $p < .05$

NOTE: The sample of Mills Ss for whom relationships with IA index scores are shown in this table consists of 76 married alumnae. The parents are mothers and fathers of members of the assessment sample.

Table 10

Multiple Prediction of Occupational Choice of Brothers
Using Childhood Activity Checklist Variables

| Occupational Choice | Variables | Beta Coefficient |
|---|---|---|
| Scientific: | Creating imaginary situations | -.59 |
| | Playing ball | -.46 |
| | Photography | .42 |
| | Writing poems and stories | .34 |
| | Playing musical instruments | .29 |
| | Multiple Correlation: +.69<br>F (5, 29) = 7.3 | |
| Other Professional: | Putting on shows | .67 |
| | Hiking | -.42 |
| | Drawing, painting or working with clay | .37 |
| | Exploring or prowling | -.32 |
| | Building models to fly, run, etc. | .25 |
| | Multiple Correlation: +.79<br>F (5, 29) = 12.6 | |
| Business: | Going around with the neighborhood bunch | -.53 |
| | Having a boy over to spend the day | .48 |
| | Building models to fly, run, etc. | -.39 |
| | General reading | -.35 |
| | Multiple Correlation: +.63<br>F (4, 30) = 6.7 | |

# APPENDIX I

## Letter of Invitation to Siblings

Dear _____,

Your sister has given us permission to ask whether you would participate in a study of personality development in families of superior "normal" persons.

Your sister first came into our series of studies as a senior at Mills College. She later took part in a study of personality changes in women during the first few years after college. We are now interested in similarities and differences in personality patterns within families. You have thus become important to us.

Enclosed is a questionnaire, which we hope you will fill out, and a return envelope. We would also like to send you several tests, which would take two to three hours to complete, distributed at your convenience over two or three weeks. There is a question about this attached to the questionnaire.

A report of the study can be sent to you if you request it. Information we receive is considered highly confidential. Nothing is published which would identify a person or family.

We hope to hear from you soon.

# APPENDIX II

## Size and Sibling Composition of Families

| | Creative | Comparison |
|---|---|---|
| **Two-Child Families (N = 22)** | | |
| G g | 3 | 3 |
| G b | 1 | 10 |
| g G | 0 | 2 |
| b G | 1 | 1 |
| G b (twins) | 1 | 0 |
| **Three-Child Families (N = 19)** | | |
| G b - | 0 | 4 |
| G g - | 0 | 5 |
| b G g | 3 | 2 |
| g G g | 0 | 2 |
| - - G | 0 | 3 |
| **Four-Child Families (N = 10)** | | |
| G g g g | 0 | 2 |
| G b g b | 2 | 0 |
| G b b g | 1 | 0 |
| Other | 0 | 4 |
| **Five-Child Families (N = 1)** | 0 | 1 |

NOTE: The Mills sister is indicated by a capital letter. Siblings are listed in order from oldest to youngest, g referring to girl and b to boy.

# APPENDIX III

## Material from the Family Influences Questionnaire

### Differences between Siblings

Overall, would you say that the differences between you and your sister whom we have studied previously are

_____very large _____average _____small

_____large _____very small

Which of the factors listed below do you think may help to explain differences between you and this sister? Please mark each statement T (True), F (False) or O (Other). When there are alternative words in parentheses, please cross out one of them so as to make the sentence read as it should.

____We were so far apart in age that we weren't subject to the same influences.
____We were different temperaments.
____The fact that we were different sexes made a big difference in the development of our personalities.
____Our parents treated us differently, with different expectations.
____Our parents took (me) (her) more seriously.
____The family had (more) (less) money when (I) (she) was growing up.
____We had different talents and endowments.
____In our family it was assumed that we were all different and would go our own way.
____We developed differently because (she) (I) didn't want to be in (my) (her) shadow.
____We didn't get along well and didn't want to be alike or to do things together.
____We looked different and people tended to think of us differently.
____(I) (she) was more influenced by mother, or more like mother.
____(I) (she) was more influenced by father, or more like father.
____(I) (she) was less influenced by our parents.
____(I) (she) was more influenced by friends or siblings.
____(I) (she) reacted more against mother.
____(I) (she) reacted more against father.

Comments:

## Sibling Differences, continued . . .

Please put a check in the column which best describes the difference, in childhood, between you and your sister whom we studied.

| Characteristic | Sister Stronger | Not Much Difference | Sister Weaker |
|---|---|---|---|
| Helpfulness at home | | | |
| Pleasant disposition | | | |
| Congeniality with mother | | | |
| Congeniality with father | | | |
| Many friends | | | |
| Close friends | | | |
| Good looks | | | |
| Personality, charm | | | |
| Persistence | | | |
| Rebelliousness | | | |
| Practicality | | | |
| Strong interests | | | |
| Initiative | | | |
| Femininity (for sisters only) | | | |
| Creativity | | | |
| Orderliness | | | |
| School achievement | | | |
| Esteem from mother | | | |
| Esteem from father | | | |
| Self-confidence | | | |
| Seriousness | | | |
| Self-control | | | |
| Intelligence | | | |

## Parental Values for Child

How much did your parents value, for you, the characteristics which are listed below? Please put a 3 by the three characteristics which were most highly valued, a 2 by the three that were next highly valued, and a 1 by the remaining four traits which were least highly valued. There are separate columns for you to indicate the values of your mother and father for you.

| Mother | | Father |
|---|---|---|
| _____ | Ambitious | _____ |
| _____ | Companionable, responsive | _____ |
| _____ | Dependable | _____ |
| _____ | Feminine (or masculine) | _____ |
| _____ | Independent, self-reliant | _____ |
| _____ | Intellectually curious | _____ |
| _____ | Possessing strong moral integrity | _____ |
| _____ | Professionally or artistically productive | _____ |
| _____ | Tender-hearted, good | _____ |
| _____ | Well-adjusted | _____ |

6-8012



Title: EFFECTS OF SIBLING CHARACTERISTICS AND PARENTAL VALUES ON CREATIVE INTEREST AND ACHIEVEMENT

Investigator: Ravenna Helson

Institution: Institute of Personality Assessment and Research, University of California, Berkeley

Project number: S-012-66

Duration: May 1966 to April 1967; extended to September 1967

## BACKGROUND

Previous work has shown that characteristics of parents are related to creative interest and achievement on the part of the child. The effects of siblings have received less attention, although it is known that first children are overrepresented among the eminent, that intellectual characteristics show some relation to ordinal position and composition of the family, and in a general way that sibling rivalries and sacrifices may affect the utilization of talent. Studies of the effects of sibling position on personality and achievement have often given conflicting results. They usually consider a narrow range of variables. It was hoped that a broader study, concerned with both values of parents and traits of siblings, as perceived by the individual in relation to himself, would show clearly a pattern of family relationships predictive of creative achievement.

There was available considerable information about a sample of women who had been evaluated as creative by their college faculty. Since creative

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productivity is rare among women, despite much encouragement from educators, it was thought that the family background of these women might be distinctive, and that study of their family relationships might contribute to a better understanding of what is often considered to be the social waste of talent in women.

OBJECTIVES

1. The central question was whether a pattern of relationships could be demonstrated which would be consistent with the following conceptualization: the motivation to engage in creative activity, for a child, reflects (1) dissatisfaction with one's relationships in the family; (2) symbolic facility and an approach to the world which is focused on the potential or intuitive rather than the practical; (3) confidence that by one's efforts and initiative one can intervene in (symbolic) affairs and (4) bring about a more satisfying position in the family. The values of the parents -- intellectual, individualistic, and achievement-oriented or social and conformity-oriented -- were considered to be important in whether the child could improve his position by creative activity.

2. Another objective was to describe differences in the family experience of brothers and sisters, with a view to understanding factors generally related to the low level of educational attainment and creative productivity among American women.

3. It was also of interest to differentiate among the important characteristics of the creative person, to explore what might be different family origins of creative intellectual traits and achievement-orientation.

4. There was finally the desire to explore childhood interest patterns as an expression of the child's needs and relationships within the family and as predictors of adult occupational choice.

PROCEDURE

Young adult Ss furnished,by mail, personality inventory data together with questionnaire information about family influences in their childhood. The sisters of these Ss had been studied when they were seniors at Mills College. Some of them had been evaluated by their Mills faculty as creative, with substantiation from assessment findings and a post-college follow-up. Data obtained from parents of a subset of the college women were available to be presented in conjunction with the reports of the siblings.

Personality tests which were sent to the siblings were chosen to give a comprehensive picture of the personality functioning of these young adults with particular attention to traits relevant to cognitive style, educational attainment and creative productivity. These tests were the California Psychological Inventory, the Type Indicator, the Adjective Check List, the Art Scale, and supplementary items to allow scores to be computed on measures of originality, complexity of outlook, independence of judgment, and general effectiveness.

The questionnaire included comparisons between the sibling and his sister on various traits and relationships with parents in childhood and questions about childhood interests, values of parents and educational attainment.

In a general correlational analysis, personality test scores for all siblings and selected scores for the Mills sisters were correlated with each other and with measures from the questionnaire. There were also t tests computed on all of these variables between groups which were constituted to investigate the influence of sex, sibling position,and creativity of sister. Thirdly, several multiple prediction analyses were conducted, primarily to show whether creativity and educational attainment could be shown to be

associated with the predicted pattern of family relationship variables.

RESULTS

1. The brothers of the Mills women who had been evaluated as creative had significantly higher scores than brothers of other Mills women on several of the measures of creative traits. On the California Psychological Inventory they showed a pattern of intellectual openness and effectiveness combined with self-confidence and spontaneity. This pattern has been obtained in previous studies of creative men.

2. Sisters of the Mills creatives were all younger sisters, and they were younger than the other Ss. Like the brothers, they had scores on several of the measures of creative cognitive traits which were higher than those of the sisters of other Mills women. However, on the California Psychological Inventory what they had in common which differentiated them from other sisters was only some lack of confidence and forcefulness.

3. As their creative sisters had done previously, the brothers of the creatives attributed more stress on moral integrity to their fathers than did other brothers. They also attributed less stress on ambition to their mothers. The sisters of the creatives did not differ significantly from other sisters in their ratings of parental values.

4. The brothers of the creatives differed from other brothers in feeling they had been taken less seriously by their parents in childhood than their sisters. They did not feel they had been more practical than their sisters, nor that they had had stronger interests, as the other brothers did.

5. The sisters of the creatives rated themselves as having been more congenial with their mothers in childhood than the Mills sister, and differed from sisters of other Mills women in this respect. They also rated themselves

as less self-confident.

6. For brothers, four of the variables from the questionnaire yielded a multiple correlation of .73 with being the brother of a creative. These were being taken less seriously by the parents, attributing stress on moral integrity and on professional and artistic productivity to the father, and attributing to the mother little stress on ambition.

7. For sisters, a multiple correlation of .47 was achieved with two variables, "parents treated us differently with different expectations" and self-confidence rated as lower than that of the Mills sister.

8. In this study educational attainment showed high correlations with indices of creative traits. Among the entire group of siblings, educational attainment was related to being male, to having had less personality than the Mills sister in childhood but stronger initiative, intelligence, creativity, school achievement, esteem of mother and esteem from father. There were also significant correlations with father's stress on professional or artistic productivity and on ambition.

9. Among brothers, a multiple correlation of .70 with educational attainment was achieved with these variables: positive loading on self-rating as more intelligent than sister and as having had stronger interests than sister; negative loadings on having been more practical, having had more personality, and having been treated differently by the parents. Of these, having been less practical than the sister had the heaviest weight.

10. Comparisons of brothers and sisters of the Mills women showed brothers to be higher in educational attainment and to have higher scores on scales for Dominance and General Effectiveness. They had lower scores on Responsibility and Feeling (as opposed to Thinking). Brothers, more than sisters, rated themselves as having been more practical and intelligent than

the Mills sister and as having had more esteem from both the mother and the father. They rated themselves as having been less helpful around the home. The brothers attributed to their fathers more stress on ambition, whereas the sisters attributed to their fathers more stress on being tender-hearted and good and on being companionable and responsive.

11. Effects associated with sex and sibling position varied according to whether the Mills sisters were included in the groups. For example, brothers as a group were not higher on General Effectiveness if their Mills sisters were included with the other sisters. Oldest girls were higher on Responsibility and Self-control than other sisters only when the Mills Ss were not included in the comparisons.

12. Separate study was made of Complexity of Outlook and General Effectiveness, which were taken to represent two aspects of the creative process. Complexity of Outlook was related to verbal aptitude and to occupational choice; among brothers being more complex in outlook than one's sister was related to having had a more congenial relationship with the mother. General Effectiveness was related to being male and to having had more initiative, confidence, intelligence and esteem from the father than one's sister.

13. Correlations between siblings on measures of achievement-orientation and effectiveness were low, but there were high correlations between siblings on measures of the creative cognitive traits. These correlations were generally higher than the correlation between the score of the Mills sister and her own verbal aptitude score.

14. The resemblance between siblings on measures of creative traits thus depends only in part, one presumes, on inherited factors of intelligence. It depends also on familial disposition to accentuate or suppress emotional

discord. Women who had strong imaginative and artistic interests in childhood had siblings who made high scores on the creative cognitive traits and, as parents of these women had done also, showed low defensiveness and related personality traits on the Adjective Check List.

15. In comparison with their sisters, many of whom had been classified as creative, the siblings of the women who had strong imaginary and artistic interests tended to have been less rebellious and less confident as children and to have higher scores on the Achievement by Conformity scale as young adults.

16. Certain patterns of childhood activities were associated with occupational choice among brothers. Men who went into science reported having liked activities which were individualistic, analytically intellectual, or artistic but highly structured. Men who went into a non-scientific profession were distinguished by interests which involved a freer or more dramatic type of imaginary play.

## CONCLUSIONS

1. A patterning of family relationship variables, defined so as to have psychological relevance for the individual, appears to be associated with creatively productive personality and with educational attainment.

2. Results are generally consistent with the conceptualization that this pattern includes dissatisfaction with one's position in the family had paternal emphasis on individualistic, intellectual and achievement-oriented values, for a child who has symbolic facility, the capacity to receive gratification from symbolic activity, and confidence in his intellectual effectiveness.

3. A lack of concern with conventional sex-role differentiations seems to have been characteristic of the parents of the creative Ss in this study. The creative sister was taken seriously and expected to show moral integrity in a way that differentiated her from other women and went opposite to the general pattern of sex differences. The brothers of the creatives rated themselves as less practical than other brothers, and in so doing they diverged from the general pattern of sex differences. It is true that the younger sisters of the creatives felt a different attitude from the parents, one that was in some ways more conventional. Since they did not appear to suffer any intellectual disadvantage, the importance of changing parental needs and expectations is emphasized in their case. The data are consistent with the idea that esteem is sought as a substitute for a close personal relationship with the mother.

4. Comparisons of brothers and sisters suggest that upper middle class brothers respond to family stress on ambition and perceive themselves as more intelligent, effectual and esteemed by parents than their sisters. When the families of the creatives are excluded, brothers rated themselves also as having been taken more seriously by their parents. The sisters appear to have received the advice,"Be good and helpful around the home, sweet maid, and let who can be clever, ambitious, taken seriously, and esteemed by parents." That fewer sisters than brothers show high achievement is certainly to be expected from their different family experience. However, the expectation that boys be practical would seem to be a frequent handicap to their development of a broad and rich intellectual outlook.

5. There is considerable resemblance among siblings in creative intellectual traits. This resemblance rests in part upon family style in emotional receptivity and expression. In a family characterized by low control of

impulsivity, some children give evidence of a creative motivational pattern in their development of a strong pattern of artistic, imaginative or intellectually constructive interests. The girls who do so are more rebellious and self-confident than their siblings.

These are probably the conclusions of the most general importance. The study raises other questions. For example, what is the significance of the fact that the brothers of the creatives felt their mothers had put relatively less stress on ambition than other brothers did? Is it merely a reflection of family idealism, or does it also point to a type of conflict or compensatory relation between the masculine and the feminine that may be propitious to development of the creative personality? Again, what is the significance of the fact that there was more difference in Self-Acceptance between the creatives and their brothers (brothers higher) than between other Mills women and their brothers? Does it mean that girls who are taught to take themselves seriously suffer as adults from lack of social support for this self-regard? Does it also mean that many young men suffer from failure to live up to the hopes and expectations of their parents? Or does it reflect different predispositions of creative men and creative women to self-doubt and emotional complexity? Only brief discussion of questions such as these has been presented, and no more discussion seems justified on the basis of data available in this study.

## BIBLIOGRAPHY

There are 35 references listed in the final report.

## PUBLICATIONS

Preparation of the report for publication is in progress.